TECHNICAL MEMORANDUM

TO: R. Terrance & Vicki Larson, Larson Property Management, LLC

FROM: Rone Brewer; Sound Ecological Endeavors

DATE May 21, 2013

RE: LAND APPLICATION OF COMMERCIALLY PROCESSED SEASHELLS NELSON STOCK RANCH (LARSON PROPERTY) KINDRED ISLAND, TOKELAND, PACIFIC COUNTY, WASHINGTON (TOWNSHIP 14N, RANGE 11W, SECTIONS 2, 11, AND 12)

INTRODUCTION

The land application of commercially processed shellfish remains, as an agricultural soil supplement, has occurred for decades at the Larson property on Kindred Island, formally known as Nelson Stock Ranch (subject property). The spreading of dry crab, shrimp and prawn shells as an organic fertilizer was properly permitted by Pacific County Department of Community Development (DCD) under Permit PL110086SB issued Aug 22, 2011. Land application of the dry shells continued during 2011, 2012, and early 2013, being placed upon the agricultural fields of the subject property, spread, and tilled into the soil as per all permit requirements. A renewal of the Aug 22, 2011 land application permit was sought and a new Land Application Permit was granted to Larson Property Management, LLC by DCD on January 16, 2013, expiring on December 31, 2014. Subsequent to this approved January 2013 Land Application Permit, on February 26th, 2013, DCD provided further conditions for the spreading of shells on the subject property. All required DCD permit conditions have been met, or will be met at the required time. Following unsubstantiated odor complaints by neighbors to Pacific County, the Washington State Department of Ecology (Ecology), and other agencies, Ecology sent notification to the DCD stating there had been deficiencies in the DCD Land Application Permit approval process. As a result, DCD revoked their previously approved January 16 Land Application Permit in an April 10 letter to Larson Property Management, pending requirements elucidated by Ecology. The April 10th DCD letter requested compliance with all requirements of Washington Administrative Code (WAC) 173-350-040 and 230, specifically listing the need for:

1. A State Environmental Policy Act (SEPA) Checklist and a related public comment period.
2. Maps showing locations of land application.
3. A wetland delineation of the land application site and a management plan for protection of groundwater, if the groundwater is within three feet of the surface.
4. A report of agronomic application rates specific to crops produced in the application area.
5. Bi-annual soil tests, with mapped sample locations, in the spring and fall to determine soil nutrients and post application uptake.

The focus of this technical memorandum is to address bullet 3 above.

A site visit to the subject property was conducted on April 30th. The site visit and coincident discussions with the very long term subject property owners form the understanding and documentation of site conditions for the purpose of this technical memorandum.

SITE HISTORY

The subject property has been actively farmed since at least the 1930s with annual tillage occurring prior to 1985. Waste shells resulting from commercial shellfish food processing have been applied to the subject property since at least 1932. The Nelson family purchased the land in 1943 and has farmed it every year since that time. During this time, farming has included annual crop production and harvest, hay production and harvest, and/or pasture maintenance in support of livestock grazing. Sea shells of various types including oysters, crab, shrimp, and clams have been placed on the property by the Nelson family every year since at least 1943, thus the land application of shells is an ongoing soil maintenance function at the subject property.

In 1945, an approximately 5,000 ft long dike was completed, eliminating tidal intrusion into the lower reaches of Teal Duck and Kindred Sloughs, which border agricultural fields at the subject property. The current dike top elevation is approximately 17 ft measured from mean lower low water (mllw). Mean sea level (msl) at nearby Toke Point is 4.8 ft above mllw and mean higher high water (mhhw) is 8.9 ft above mllw (NOAA tides and currents online: http://tidesandcurrents.noaa.gov/data_menu.shtml?stn=9440910 Toke Point, WA&type=Datums). There are two tide-gated culverts underlying the dike, one on either side of the subject property. Water levels upgradient (landward) of the dike are most often below msl because the culverts block high tides from entering the subject property and drain the subject property during each low tide. High rainfall and coincident high tides may result in temporarily higher than average water retention upgradient of the dikes up to approximately 6.5 ft mllw. While it was not measured in the field during the site visit, based on experience at other sites within Puget Sound, groundwater underlying the farmland upgradient of the dike is expected to be at an average elevation less than msl. Based on light detection and ranging (LIDAR) measurements provided to Larson Property Management by DCD, elevations within the agricultural fields were estimated between 7 and 15 ft above mllw in most fields, but as low as 6 ft mllw in small portions of the lowest elevation fields.

Drainage of the fields is via swales (not ditches) that direct water laterally to Kindred and Teal Duck Sloughs. These swales do not extend to and discharge directly into the channel where water is

permanently present, but rather, spread into the low lying area along, but upgradient of the slough channels. The swales do not require dredging or cleaning.

REGULATORY FRAMEWORK

The Code of Federal Regulations (CFR), Title 7B Part 12 (United Stated Code Title 15 Section 714b) provides that prior converted cropland is a wetland converted to use as cropland prior to December 23, 1985, upon which an agricultural commodity had been produced at least once before December 23, 1985, and as of December 23, 1985, the converted cropland did not support woody vegetation and for which: (i) inundation was less than 15 consecutive days during the growing season or 10 percent of the growing season, whichever is less, in most years (50 percent chance or more), and (ii) if a pothole, playa or pocosin, ponding was less than 7 consecutive days during the growing season in most years (50 percent chance or more) and saturation was less than 14 consecutive days during the growing season most years (50 percent chance or more)."

In this definition the term converted means drained, dredged, filled, leveled, or otherwise manipulated (including the removal of woody vegetation or any activity that results in impairing or reducing the flow and circulation of water) for the purpose of, or to have the effect of, making possible the production of an agricultural commodity without further application of the manipulations, if: (i) Such production would not have been possible but for such action, and (ii) before such action such land was wetland, farmed wetland, or farmed-wetland pasture and was neither highly erodible land nor highly erodible cropland. At the subject property, based on vegetation conditions in fields waterward of the dike elevations below approximately 9 ft mllw likely were wetland prior to installation of the dike, and the higher elevation fields were not, and still are not, wetlands as evidenced by U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps and the well-drained nature of the sandy soils. Subpart C of CFR Title 7 Part 12 provides methods to be used to identify whether an area of interest is wetland or converted wetland, as well as uses allowed on farmed and prior converted wetlands. As detailed in the next section, much of the subject property meets the definition of prior converted wetlands.

In WAC 173-350: Solid Waste Handling Standards, shells such as those spread on the subject property are not specifically described, but the closest definition appears to be "organic" "food processing waste" (WAC 173-350-100). These dry shells are eligible for a beneficial use exemption (WAC 173-350-200; RCW 70.95.205 and 300), for which a State Environmental Policy Act (SEPA) checklist submittal would be required, however application for such an exemption has not been made, thus there is no requirement for completion of a SEPA checklist. Further, WAC 173-350-030 provides that the

effective date of current regulations is June 30, 2014 for existing facilities. Because shells have been spread at the subject property for many decades, the subject property is an existing facility, and therefore the owners should have been provided until June 30, 2014 to comply with regulations before their land application permit was revoked in the April 10 DCD letter.

The April 10 DCD revocation letter cites the need to meet requirements of WAC 173-350-040 and -230. The requirements within WAC 173-350-040 are protection of human health and the environment, compliance with local regulations and local solid waste management plans, and maintenance of surface water, groundwater and air quality. In specific regard to water quality, RCW 90.48.450 provides that consideration be given as to whether an enforcement action would contribute to conversion of land to non-agricultural use. This is important because the subject property is PCC, and delineation of wetlands as requested in the revocation letter, for consideration of shells as wetland fill, is contrary to allowed use of PCC and contrary to PCC exemption from wetland regulations administered by the Army Corps of Engineers (Corps) and U.S. Environmental Protection Agency (USEPA) under Section 404 of the Clean Water Act. Further, human health, the environment, water quality, and air quality have all been protected through the application and implementation of DCD solid waste management and permitting requirements.

PRIOR CONVERTED CROPLAND

The U.S Department of Agriculture Natural Resource Conservation Service (NRCS) is the regulatory authority for prior converted cropland and the NRCS provides that farmland meeting the following criteria may be designated as PCC:

- Cropped prior to December 23, 1985 with an agricultural commodity;
- The land was cleared, drained or otherwise manipulated to make it possible to plant a crop, and the manipulation has been maintained, but not expanded since December 23, 1985;
- The land has continued to be used for agricultural purposes (cropping, haying or grazing)
- The land does not flood or pond for more than 14 days during the growing season

As noted earlier in this technical memorandum, the higher elevation portions of the subject property were initially farmed prior to 1943 by the previous owners, the Kindred family. In 1943 the Nelson family (current owners) purchased the property and they have farmed it for crops, hay, or pasture every year since the purchase. This early farming entailed tilling of land to the lateral extent of the area not impacted by tides, likely slightly above mhhw (8.9 ft mllw), where tidal wetland conditions and salt content did not fetter tilling and plant growth. The upland area south (seaward) of the current dike was, and is still,

farmed to a similar extent as that prior to dike placement. Early pre-dike crops included oats and hay as agricultural commodities.

In 1945 the dike was completed, blocking tidal flow into and draining Teal Duck and Kindred Sloughs with tide-gated culverts. The five ft diameter Teal Duck Slough culvert bottom is at an elevation of approximately 1 ft mllw. The four ft diameter Kindred Slough culvert bottom is at an elevation of approximately 3 ft mllw. Water from the higher elevation Kindred Slough can flow around the northwest portion of the subject property into the northern reach of Teal Duck Slough. Since dike completion in 1945, surface water from the sloughs has drained through the installed culverts at each low tide, limiting Teal Duck and Kindred Slough water levels to an average of approximately 4 ft mllw. Based on current winter flooding of low-lying areas adjacent to the slough channels and concurrent tide and water levels at the Teal Duck Slough culvert, the likely average groundwater elevation underlying the subject property has been 3 to 4 ft mllw since installation of the dike. In the first few years after the dike and culverts were completed, lower water levels allowed land between mhhw (8.9 ft mllw) and approximately 5 to 6 ft mllw to be cleared of salt marsh vegetation and used for crops, hay, and pasture. Finally, the drainage systems have been maintained over the years and there is a current permit with Pacific County to continue these maintenance processes, including replacement of slough crossings/culverts and maintenance of irrigation diversion sites that have been present since the dikes were built. Other than maintenance functions, no alterations have been made to nearby wetlands or slough channels since the dike was completed. All of these conditions indicate the subject property is PCC.

During the April 30th site visit, an examination was made for ponding on the subject property. Rainfall for the area was approximately 2.5 inches above average for the preceding month and over 0.6 of an inch of rain had fallen in the previous three days, at nearby Hoquiam. The only surface water outside of the two sloughs and irrigation points of diversion were very shallow rivulets in the bottom of several drainage swales. Discussion with the landowners provided the fact that they had driven the fully loaded dump trucks across the land application area during winter months, strongly suggesting the soil drains readily. This is supported by the presence of well-drained sandy soils within the land application area. The lower elevation loamy soils also had no ponded water at the time of the site visit, appearing well-drained, either via the drainage swales, overland flow, and/or infiltration. Given evidence available at the time of the site visit, ponding of water for 14 days during the growing season is not occurring on prior converted cropland portions of the subject property.

At the subject property, the four NRCS criteria for PCC designation are met. If not through subsection (1)(f) of section 1344 of the Clean Water Act (United Stated Code 33), then by meeting the criteria for PCC under Code of Federal Regulations Title 7, Part 12, the subject property and the normal

and ongoing farming activities that have occurred there for over 80 years are exempt from wetland regulation under Section 1342 and 1344 of the Clean Water Act, and thus, a Section 404 wetland delineation is unnecessary. A formal application is currently being made to the NRCS for a PCC wetland delineation at the subject property.

GROUNDWATER

The elevation of groundwater underlying the subject property has not formally been measured. Following completion of the dike and tide-gated culverts in 1945, drainage of Teal Duck and Kindred Sloughs increased, and this resulted in a lower average groundwater level under the fields compared to before the dike was constructed. This is evidenced by the ability to farm lower elevation converted croplands. The elevation of water in Teal Duck and Kindred Sloughs is estimated to be at an average of 4 ft mllw. Based on current winter flooding of low-lying areas adjacent to the sloughs, and concurrent tide and water levels at the Teal Duck Slough culvert, 3 to 4 ft mllw is likely representative of average groundwater elevation underlying the subject property since installation of the dike.

Under permit conditions for the protection of surface water, all shell applications must occur 100 ft from Teal Duck and Kindred Slough surface water and 30 ft from drainage ditches, if present. Following the elevation contour associated with a 100 ft distance from the sloughs, within the area of shell application delineates a minimum field elevation of approximately 7 ft mllw, or higher. Assuming groundwater is at approximately 3.5 ft mllw, the depth to groundwater in the land application areas ranges from a minimum of 3.5 ft closest to the sloughs, to approximately 12 ft in the highest land elevation areas. This distance is greater than the required 3 ft between groundwater and the surface, considered to present adequate protection of groundwater from the leaching of land applied organic food processing waste. This, combined with the existing agronomic application analysis showing more plant uptake of nutrients than are applied, strongly suggest leaching of nutrients to groundwater will not occur, and water resources are protected.

CONCLUSIONS

Given decades of beneficial shell application to the agricultural fields, the subject property is an existing shell application site, and therefore the April 10, 2013 revocation of the permit was inappropriate and the owners should have been provided until the WAC 173-350 effective date of June 30, 2014 to provide permit application information.

The subject property qualifies as prior converted cropland under the auspices of the Food Security Act. Therefore, wetlands at the subject property are not regulated under Section 404 of the Clean Water Act.

The dry shells applied to the land are organic food processing waste. An agronomic analysis has shown that even with application in considerable excess of proposed rates there will be a nutrient deficit in the soil for all crops to be grown on the subject property, including pasture grass. Groundwater is more than three feet below the ground surface in the area of land application. By existing DCD permit the shells must be spread and tilled into the land to prevent surface runoff. Land application will not be conducted within 100 ft of natural surface water bodies and there are no direct runoff routes or point source discharges from the land application areas to surface water. These facts combined with existing permit conditions and applied best management practices prevent threats to human health and the environment. The land application of dry sea shells is an ongoing legal and safe agricultural soil maintenance activity.